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ABSTRACT

In 1997, the German Federal Ministry of Education and Research started an initiative to promote e-learning in Germany by installing an extensive research program. The Virtual University of Applied Sciences in Engineering, Computer Science and Economic Engineering is the most prominent and best-funded of the more than 100 projects in the field funded by the German Federal Ministry of Education and Projects. Officially begun in 1999, its origins go back to 1997 when the faculties at Luebeck University of Applied Sciences set up a working group on online education. In October 2001, the study program of Computer Sciences started in seven joint universities of applied sciences with six courses. Twelve universities of applied sciences, two universities, federal employees' association, unions, and business of seven federal states are involved in the development of the two complex online study courses Computer Sciences and Economic Engineering. This paper discusses the objectives and project tasks; the Virtual Campus Association of Universities of Applied Sciences; course material and course tutoring; the learning management system; computer supported collaborative learning; and running the online study program. (Contains 16 references.) AEF)

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Virtual University of Applied Sciences – German Flagship Project in the Field of E-Learning in Higher Education

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1 Introduction

In 1997, the German Federal Ministry of Education and Research started an initiative to promote e-learning in Germany by installing an extensive research program. Actually, more than 100 projects have been funded by the German Federal Ministry of Education and Research in the field of e-learning in higher education. Three of them are so-called Flagship Projects, of which the Virtual University of Applied Sciences in Engineering, Computer Science and Economic Engineering is the most prominent, and with DM 42 million the best funded.

Officially begun in 1999, its origins go back to 1997 when the faculties at Luebeck University of Applied Sciences set up a working group on online education. In October 2001, the study program of Computer Sciences started in seven joint universities of applied sciences with six courses. In the meantime, first results are available. The second study program, Economic Engineering, will start in winter semester, 2002.

2 Presentation of the Project

Twelve universities of applied sciences, two universities, federal employees' association, unions, and businesses of seven federal states are involved in the development of the two complex online study courses Computer Sciences and Economic Engineering.

2.1 Objectives and Project Tasks

The ambitious goal of the project is to form a virtual organization of ten existing campus-universities of applied sciences from six German federal states[1]; in essence, this means a decentralized and distributed management.

The responsibilities of each of the involved universities are precisely defined, i.e. for administrative services, technological support, deployment of the common curricula of the study programs, development of courses and learning objects, instruction and tutorial support etc. The design of each of the courses is always incumbent on only one chosen member of one of the involved universities. Later on, the complete course will be adopted by all participating universities. All courses are being approved jointly. Suitable modules from commercial vendors may also be employed, provided they meet the required quality standards. The traditional unity of course design and teaching is thus partly abrogated.

The conception of the Virtual University of Applied Sciences is based on the combination of multimedia course materials, a professional online tutoring including students' coaching and group working and a sophisticated administration of the whole study program.

The last-mentioned topic required the choice of a suitable learning and administration management system which would be able to combine the individual demands of the universities due to their inscription and student management modalities as well as a flexible tutoring of the students by their professors and tutors, and to offer sufficient communication tools for the social and course specific exchanges between the students.

[1] For a list of participating universities see www.oncampus.de

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The large amount of about 60 subjects to fill the curricula of the two study courses made intensive research efforts necessary in order to deliver the technical, ergonomic and didactic fundamentals for a common and high standard of the course material and concepts. The common conceptual guidelines for the subjects should furthermore take care of the individual didactic belongings of course subject and the responsible experts.

For the implementation of the study courses in the participating universities, the instruction of the teaching and tutoring personnel as well as the foundation of common working groups and specialist peer groups had to be taken into account . First experiences which delivered the knowledge for this part of the pr oject had been collected during the pilot phases of the first developed courses.
In the meantime, nearly 35 percent of the courses have been finished. Most of them were tested in pilot trials with distributed students. With the results of these tests, qua lity criteria and procedures for the courses at the Virtual University of Applied Sciences could be determined. On the basis of these experiences, all students and tutors involved are integrated in a well developed evaluation system which enables the cont inuous optimisation of course production and course maintenance.

2.2 The Virtual Campus Association of Universities of Applied Sciences

The Flagship Project will provide the courses for the common study programs up to the end of 2003. To run these study programs is task of the involved universities. To achieve this, in April 2001 7 of the universities founded a consortium, the so called "Virtuelle Fachhochschule", which has been offering the study programs to online students first beginning in October 2001.

Forming this virtual organisation, the universities defined and agreed on the rules of cooperation, of handling the intellectual property rights of the learning objects, of responsibility for quality of learning objects and tutoring, and of financing the future activities.

The responsibilities of the universities in detail affect for example the sustainability of the course range, the rights on the course materials, the use of the learning management system, the commitment to the maintenance of courses, and the organisation of students' inscription.

The universities of the consortium signed a contract on these topics to be able to run and sustain the study programs in the long term. Partners of this consortium are those universities within the project that have started or soon will start with at least one of the common deve loped study programs. The conditions of the study programs are equivalent within the whole consortium. So students normally apply to the university where they want to have their residential periods.

The common organisation is gradually being reduced to an optimum, a process being ruled by the federal legislation, the individual needs for autonomy of the joint universities, and by economic criteria. So after the end of the project, there will only remain a small common bureau for the joint universities which will be responsible for the technical support, marketing and data management.

The administration of students, tutors and professors as well as the running of the courses and the maintenance of course materials will be the responsibility of the single universities.

3 Conceptions of Learning and Teaching

3.1 Course Materials and Course Tutoring

The online study programs of the Virtual University of Applied Sciences are especially directed to students who have an essential need for flexibility regarding time and space as a prerequisite in taking up a university course.

The curricula of the programs are strictly modular and based on the European Credit Transfer System.[2] A modular study program at the Virtual University of Applied Sciences, e.g. Economic Engineering, consists of several courses, for instance marketing, accounting, logistics etc. It is being stressed that the approach favours student-centered learning. Final examinations (in the end of each course) are identical at each of the universities.

A typical course consists of 80 percent elearning components and 20 percent face-to-face encounters. Students are not isolated while doing an online course and using interactive course materials. Professors and tutors, especially trained for the demands and needs of online students, guarantee regular contact and qualified advice. Communication with fellow students in the virtual learning room enhances the learning process.

The training of the tutors and online professors aims at teaching the different special skills necessary to carry out online courses instead of face-to-face lectures. Partly, these are technical and organisational abilities, as for example the handling of hard- and software, communication and information tools of the Learning Management System (LMS), the organisation of course materials and the administration of student groups. Concerning technical questions, the tutors should be able to offer a first level support in order to support students during their working processes.

Furthermore, tutors and teachers have to learn how to compensate the restrictions of web based learning. These can be missing awareness and missing social contacts with other students, missing direct reactions to open questions and misunderstandings. These shortages are disadvantages of the online teaching and learning and can lead to demotivation. To compensate these disadvantages teachers have to learn to apply very consciously and carefully specific social and pedagogical measures. Students have to be motivated for and integrated into the learning processes. They must learn to use the flexibility of web based training but also to accept the specific requests of the medium. That is what the teachers have to do. A special ability to learn is the initiation and moderation of virtual group works via the internet and LMS.

Virtual group work is an integral part of the didactic concept of the Virtual University and integrated in several study courses. Students are building a network of specialists whose communication and competence extends beyond the demands of the study program.

The online study is complemented by various residential periods that also strengthen the social components. Residential periods are organised by the respective university and - as a rule - take place as compact seminars in the weekend. Within the consortium, practical training, lab work, tests and/or final exams take place during residential periods.

Each course contains a large amount of multimedia course materials. Typical elements are html pages, flash animations, graphics, sounds and video. These elements are completed by scripts, links, online books or databases.

The content of the course material is selected by one responsible expert, normally a professor and member of one of the joint universities. The content and the design of the course is fixed

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[2] For further and detailed information on the study-programs and their courses see www.oncampus.de

in agreement with a peer group of colleagues from partner universities. At least one member of the peer group is experienced in the design of e-learning courses.

The production process was developed over the first two years of the project, heading for a constant and continuous quality. It includes the design of a prototype of the course on the basis of a common and quite complex styleguide and a multimedia catalogue. The prototype is evaluated by expert groups concerning didactic, technical and ergonomic aspects.

After a common review and discussion of correction measures, a team of multimedia producers writes the story board and subsequently produces the whole course. The last step is the testing of the course material in a pilot phase.

During the term, these especially developed course materials are supplemented by additional assignments and partially by group works and case studies.

Pursuant to the European Credit Transfer System each course (5 credit points) is designed for a working load of 150 h.

3.2 The Learning Management System

The delivery of the course contents is decentralised and spread to different universities. Each university that matriculates students to the common programs must have access to the whole course program. To get a high availability of all the courses and a cost-efficient system design, the operative systems work on a common server architecture with a common learning-management-system. The servers are designed with back-up systems on different locations, using existing net resources with high-speed access.

As a common learning-management-system, a standard application was achieved. After an evaluation of different systems, the Blackboard V level III-software was installed for the needs of the whole consortium. The performance and scalability of the system was tested in pilot applications for 3 semesters.

The production of course materials for self-organised learning is independent from this platform, so that the learning objects can also be used in other environments without redesign. To improve the course production some specific tools had been provided, especially for navigating the learning objects, including glossary and annotation functions.

During the evaluation, 15 platforms for the learning management system were analysed. 8 of them were installed and tested in the project. These were the products: Lotus Learningspace (IBM), CourseInfo (Blackboard), WebCT, Pathware (Macromedia), LUVIT, TopClass, Gentle (Hyperwave), DLS (ETS-Online).

The selection of the LMS was done on the basis of common criteria such as[3] Web Browsing, Asynchronous and Synchronous Sharing, Student Tools, Support Tools (Course, Lesson, Data, Resource, Administration, Help Desk) and Technical Administration (Server Platform, Client Platform, Limitations). The criteria were weightened with highest values for the communication tools and administration facilities. These facilities are of high priority for the cooperation and common course running of the joint universities. Three products were proven in pilot tests: Lotus Learningspace, Gentle, and Blackboard. As a result of the evaluation in 1999, the Blackboard System was chosen as platform for the project because it achieved the highest total evaluation score. In the detailed analysis it fitted best according to the demands of students' administration.

[3] www.c2t2.ca/landonline

3.3 Computer Supported Collaborative Learning

One of the project's working groups is involved in the development and testing of Computer Supported Collaborative Learning, especially supported group learning. In this context, an interesting new form of online collaboration, called the jigsaw method, was carried out. Group techniques and methods show great promise in the learning effects, also in Computer Supported Collaborative Learning (CSCL). These should result from the perspective of cognitive elaboration, the construction of shared knowledge and the possibility of multiple perspectives. However, previous results in this field of research were not very extensive. Therefore a jigsaw was started in CSCL.

The jigsaw method is a group work teaching process which is well known in traditional classroom learning but new in online teaching. The method bases on the working on a topic under different perspectives and with different intentions. One instrument to reach an intense preoccupation with the topic is to mix the groups at least one time and to force the members of the new groups to represent and defend the results of their former groups in order to find to a new synthesis. The jigsaw method is carried out in several phases, with each of them resulting in a concluding report or a group statement.

During the course of "Environment-oriented Management" (EoM) (subject in the study course Economic Engineering), the different assumptions and suppositions of the effect of the jigsaw method were tested. The case study focused on the evaluation of the degree of collaboration and the influence of the group method. The result was that jigsaw proved to be an efficient method of intensifying collaboration in CSCL. However, there are certain conditions to be considered. Facets like group cohesion, individual competence, and awareness have a significant influence on the result of the jigsaw.

3.4 Cooperative Teaching

Teaching at the Virtual University of Applied Sciences is a cooperative process. It starts with the foundation of one expert group for each subject. This group comprises one responsible expert of each university which offers this subject. Normally, these expert groups meet for special training programs in online tutoring, designed for the members of the joint universities. The expert groups discuss and balance the details of the course tutoring, the residential periods and the final assignments. These steps need a very intense process of discussion.
Despite several differences in the expert groups concerning the subject details, by now it has been possible to reach a cooperative teaching for each of the offered subjects. . This can be regarded as a real success of the project. The chosen model for the course tutoring which was installed seems to allow a rather satisfying degree of individuality for the participating experts on the basis of the common course materials.

4 Running of the Study Course Computer Sciences

4.1 Organisation

The Bachelor study program in Computer Sciences started in winter 2001 with about 200 students at 6 universities. Participants in the tuition fee-free Bachelor degree program will graduate after six semesters, a Master's candidate after additional four semesters. These study programs are part of the regular studies of the universities.

A concept was generated for sustainable financing of these study programs regarding the costs for

- permanent updating of the courses

- online-tutoring
- residential phases and
- organisation of the consortium and common services.

The virtual organisation is dedicated to the purpose of developing and offering common online study programs and of optimising the use of the courses for study as well as for further education. For using synergies, this virtual organisation is related to the existing academic organisation of the member universities. The online programs are implemented in the existing departments and professors of these de partments are responsible for the residential periods and the quality of the tutoring.

The virtual organisation is defined on three levels:

- on the management level, the heads of the universities form a common board for all fundamental decisions
- on the department level, the heads of departments form a common committee for each field of study program: one for Computer Sciences and one for Economic Engineering.
- on the course level, professors from each department who are engaged in the same field form a common committee in which one is responsible for the availability of the modules for the whole consortium. The other members bear the local responsibility in their courses for their students concerning online as well as face-to-face tutoring.

4.2 Experiences

As one of the first results from the pilot phases in different courses and from the profiles of the online students enrolling for winter term 2001, it can be stated that these new kinds of study programs are accepted mostly by people who want to do their studies and jobs in parallel.

The online students at the University of Applied Sciences differ significantly from on-campus students: they are older, they have got jobs, and above all, they appreciate the flexibility that e-learning provides. This is not the case with many on-campus students who, as several tests showed, did not take advantage of the flexibility and instead accessed the online modules from the schools' computer labs during regular office hours. This might, in part, be explained by the still high costs for Internet access at home. Most of the on-campus students preferred the traditional face-to-face teaching.

Thus, the study program of the Virtual University of Applied Sciences does not compete with existing higher education, but rather supplements the range of teaching methods and courses available.

One positive aspect of the network for the universities is that not every institution has to fund and develop costly web-based study courses on its own. Consequently, even the medium-sized and small universities of the network will now be able to offer attractive online study courses.

5 Conclusion

The project Virtual University of Applied Sciences shows new ways of qualification models in higher education. It enables universities to reach new customer groups. The traditional universities will be able – following the model of the joint universities in the project – to step into this market using the economic advantages of cooperative teaching and course administration.

One of the main advantages of this project in comparison to others is the extensive course material which is produced during the runtime. This material enables the joint universities to create several new study programs using parts of the existing material combining it with new course contents. So the project will be the nucleus for universities reacting very flexible to demands of the labour market.
Future aspects of this project will be the internationalisation and the expansion into new study courses.

References

Arnold, P.; Didaktik und Methodik telematischen Lehrens und Lernens, Verlag Waxmann, 2002

Bischoff, M., Kwast, G., Waltje, A.; Lernmodule für das Umweltorientierte Management, Zeitschrift Umwelt, März 2001

Granow, R.: Virtual University of Applied Sciences: Book of Abstracts Online Educa, Berlin, 1999

Granow, R.: Complete online-programmes of study be a confederation of campus universities:Book of Abstracts Online Educa, Berlin 2001

Granow, R.: Virtuelle Lernarchitekturen in der Hochschule -Vom Leitprojekt zum Hochschulverbund Virtuelle Fachhochschule: Tagungsband der Learntec 2002, Karlsruhe

Hinze, U., Bischoff, M., Blakowski, G.; Jig Saw Method in the Context of CSCL, Vortrag ED Media Denver, 2002

Horton, W. Designing Web-Based Training, New York, John Wiley 2000

Kerres, M.; Multimediale und telemediale Lernumgebungen. Konzeption und Entwicklung. Verlag Oldenbourg, München, 2001

Schulmeister, R.;Virtuelle Universität. Virtuelles Lernen, Verlag Oldenbourg, München, 2001

Schulmeister, R.; Grundlagen hypermedialer Lernsysteme. Theorie - Didaktik – Design, Verlag Oldenbourg, München, 1997

Herzceg, M., Triebe, J. K., Hartwig, R.; Handbuch Ergonomie der VFH, Institut für Interaktive und Multimediale Systeme der Medizinischen Universität zu Lübeck, 2000

VFH (2000a): Zusammenstellung von diversen Lernräumen. Internes Projektpapier der Virtuellen Fachhochschule für Wirtschaft, Informatik und Technik

VFH (2000b): Zusammenfassung Lernräume. Internes Projektpapier der Virtuellen Fachhochschule für Wirtschaft, Informatik und Technik

VFH (2000): Kurzbericht Lernraum LUVIT. Internes Projektpapier der Virtuellen Fachhochschule für Wirtschaft, Informatik und Technik

VFH (2001): Handbuch Prozessleitfaden, 2001, Internes Projektpapier der Virtuellen Fachhochschule für Wirtschaft, Informatik und Technik

VFH (2002): Styleguide der Virtuellen Fachhochschule, Fachhochschule Lübeck, 2002

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